



200 West Mercer St. • Suite 401 • Seattle, WA 98119  
Phone: 206.378.1364 • Fax: 206.973.3048 • www.windwardenv.com

## MEMORANDUM

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**To:** Rob Law (de maximis, inc.)  
**From:** Lisa Saban, Mike Johns, Windward Environmental LLC  
**Subject:** Aging Analytical Fish  
**Date:** July 25, 2019

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The US Environmental Protection Agency (USEPA) has directed the Cooperating Parties Group (CPG) to age fish as part of the 2019 current conditions tissue sampling program. CPG is working to determine the specifics of a plan for fish aging that uses non-invasive methods to age fish when possible. Accordingly, scales will be used to age bass, perch, and sunfish, and fin rays/spines will be used to age carp and catfish. However, as no non-invasive method is possible for eel – which lack both scales and substantial fin rays/spines – this species will be aged using otoliths.

In an e-mail to Rob Law on June 14, 2019, USEPA provided comments on CPG's biota memorandum. These comments included reference to aging the specimens included in the analytical samples: that in the case of eel, removing the otoliths would be necessary. In addition, USEPA provided the following response to the New Jersey Department of Environmental Protection (NJDEP) on June 19, 2019:

*NJDEP: There was a discussion on removing otoliths if additional fish are sampled and/or if it will not impact the analytical sample. In the case where additional fish are aged, will these samples also be sent for analytical processing?*

*EPA: No, we need the otoliths from the samples submitted for analysis. Because eels age at wildly variable rates (they go from elvers to adults in about 3 to 30 years), if we use otoliths from "other eels" and try to calculate an age:size ratio, we'll get something less than useful. If we remove the otoliths from the actual samples submitted, we will get the actual ages of the actual eels that are analyzed. This will give us better age data for the food web models, and it will let us know how much body burden older animals have as compared to younger ones. All of this is complicated by the fact we will be compositing*

*three eels per sample, but the better data we put in, the better data we get out. Regarding the catfish, they just need to cut off one of the pectoral spines, with no loss of tissue.*

CPG agrees that the results most representative of the age of the eel used in the analytical program will be obtained using the otoliths from the same specimens as the analytical sample. However, there is a concern that the analytical specimen may be flagged during the quality assurance/quality control (QA/QC) process, since part of the specimen will have been excised. Other programs (e.g., Portland Harbor) have used separate but similarly sized “representative” specimens for otolith aging in order to avoid compromising the analytical sample.

CPG would like USEPA to review the procedures for aging with its QA branch to ensure that CPG will not receive data flagged after a substantial effort has gone into the field program.